

REMARKS/ARGUMENTS

The Examiner is thanked for the thorough examination of the present application. The Office Action, however, tentatively rejected all claims 1-19. In response to the Office Action, Applicant has amended independent claims 1 and 10 to add a features of the thermal conductive element being made of a soft material that does not damage the LED upon contact, of the heat conductive element being disposed in the through hole, respectively. For reasons set forth herein, Applicant respectfully requests that the rejections be reconsidered and withdrawn.

Regarding the claim 1 and 2, the Office Action tentatively rejected these claims under 35 U.S.C. § 102 as allegedly unpatentable over U.S. Patent 6,582,100 to Hochstein (the '100 patent). Independent claim 1 recites:

1. A heat dissipation structure for a backlight module comprising a circuit board having a through hole with a light emitting diode (LED) corresponding thereto, disposed on one side of the circuit board, comprising:
 - a heat conducting portion thermo-conductively connected to the LED and positioned in the through hole;
 - a thermal conductive element disposed between the heat conducting portion and the LED, ***the thermal conducting element being made of a soft material that is not damaging to the LED;*** and
 - a heat dissipating portion thermo-conductively connected to the heat conducting portion.

(Emphasis added.) Applicant respectfully submits that independent claim 1 defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

In advancing this rejection, the Office Action considered the thermal coupling 52 in the '100 patent as corresponding to the claimed thermal conducting portion 300, and the Office Action equated the heat sink 54 to the claimed thermal conductive element 500. Applicant respectfully disagrees.

Claim 1 has been amended to specify that the thermal conductive element 500 is made of soft material (such as a pad or a thermal conductive paste (see e.g., p. 2, lines 15-16)), which is

not damaging to the LED, and the thermal coupling 52 is a thermal conductive material selected from grease, gels or viscoelastic materials described in column 5 lines 45-51 of the '100 patent. Thus, the hard heat sink 54 in the '100 patent contacts the LED and is sandwiched between the soft thermal coupling 52 and the LED 20. In the present application, the soft thermal conductive element 500 contacts the LED and is sandwiched between the LED and the heat conducting portion 300. Consequently, the structure of the '100 patent and the embodiment defined by independent claim 1 of the present application are different. Therefore, the rejection under 35 USC 102 should be withdrawn.

In addition, because the hard heat sink 54 in the '100 patent contacts the LED 20 directly, the hard heat sink 54 may damage the LED 20 in assembly process as described in the prior art of the present application. The present application, however, defines a soft heat conductive element 500 to contact the LED to prevent damage of the LED. At least this feature of the present application is not obvious from the '100 patent, and for at least this reason, independent claim should be allowed. As claim 2-9 are dependent on the claim 1, claims 2-9 are not obvious from the '100 patent and should be allowed as well.

Regarding claims 10 to 12, the Office Action rejected these claims under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. patent 5,785,418 (the '418 patent), LED 28 is disposed on a circuit board 26. A pad is disposed beneath the circuit board 26. A plurality of through holes can be formed on the circuit board 26, through which the LED leads 30 and 32 extend for heat conduction to pad 50. A thin layer 56 is attached to the pad 50 via adhesive 58. In comparison with the features of the present application, the '418 patent discloses through holes through which the LED leads extend. The heat conducting portion 300 and the soft thermal conductive element 500 of the present application are both disposed in the through holes. In the '418 patent,

however, no element, as the soft thermal conductive 500, can be found in the through hole. Instead, only the LED lead is disclosed to be disposed in the through hole. The structure of the '418 patent and the embodiment of claim 10 are, therefore distinct. For at least this reason, the rejection of claim 10 under to 35 USC 102 should be withdrawn. As claims 11-19 depend from claim 10, the rejections of these claims should be withdrawn for at least the same reasons.

Regarding claim 12, in the Fig. 2 of the '418 patent, the adhesive 58 does contact the thin layer 56, but does not contact the LED 28 (the circuit board is between the adhesive 58 and the LED 28). Therefore, the rejection according to 35USC 102 is misplaced and should be withdrawn.

In addition, as the soft thermal conductive element can protect the LED, and no such element is found in the '418 patent, the feature of the application is not obvious from the in the '418 patent.

CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fee is believed to be due in connection with this Amendment and Response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By:

A handwritten signature in black ink, appearing to read "Daniel R. McClure", is written over a horizontal line.

Daniel R. McClure

Registration No. 38,962

Thomas, Kayden, Horstemeyer & Risley, LLP
100 Galleria Pkwy, NW
Suite 1750
Atlanta, GA 30339
770-933-9500